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# 2SD2138A

## Silicon NPN triple diffusion planar type darlington

For power amplification

Complementary to 2SB1418A

**■ Features**

- High forward current transfer ratio  $h_{FE}$  which has satisfactory linearity.
- Allowing supply with the radial taping

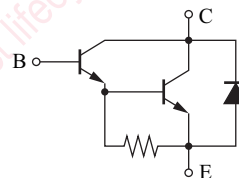
**■ Absolute Maximum Ratings**  $T_C = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	80	V
Collector-emitter voltage (Base open)	$V_{CEO}$	80	V
Emitter-base voltage (Collector open)	$V_{EBO}$	5	V
Collector current	$I_C$	2	A
Peak collector current	$I_{CP}$	4	A
Collector power dissipation	$P_C$	15	W
		$T_C = 25^\circ\text{C}$	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

**■ Package**

- Code  
MT-4-A1
- Pin Name
  1. Base
  2. Collector
  3. Emitter

**■ Internal Connection**



**■ Electrical Characteristics**  $T_C = 25^\circ\text{C} \pm 3^\circ\text{C}$

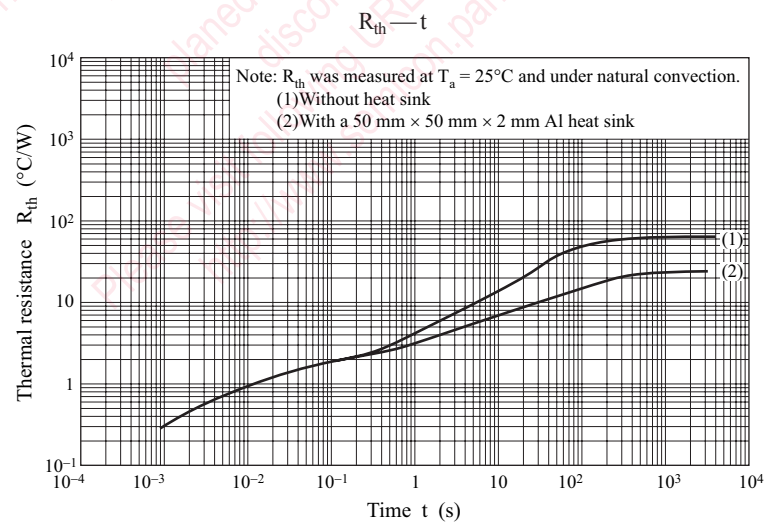
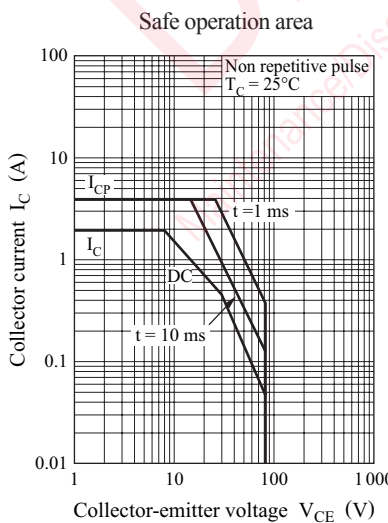
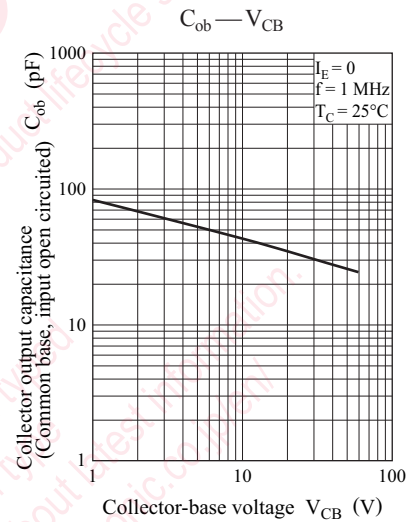
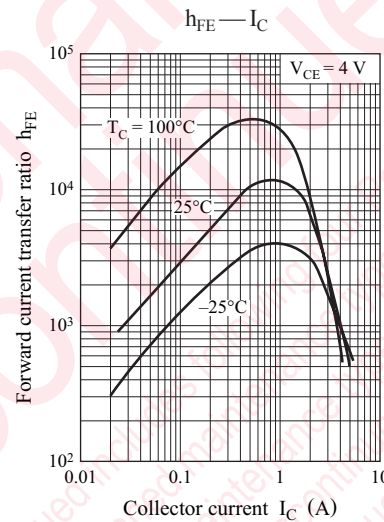
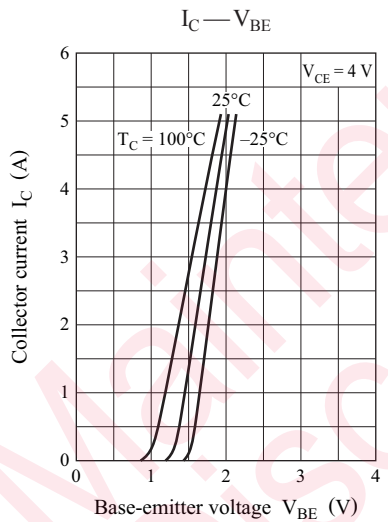
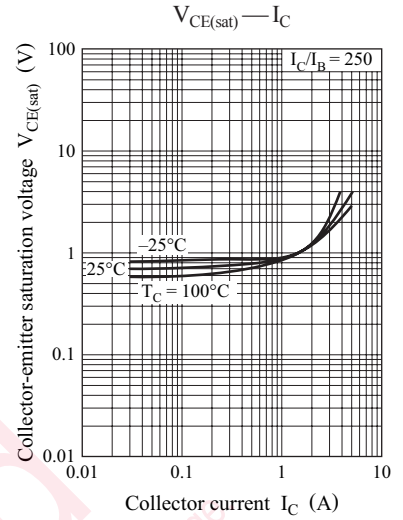
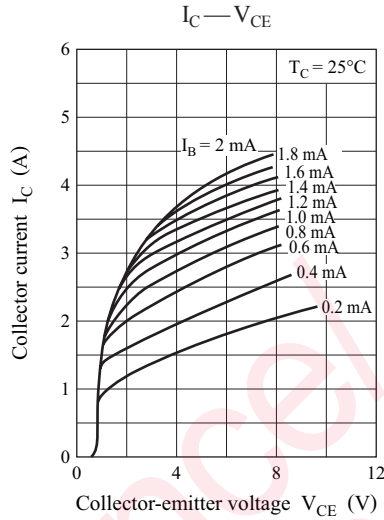
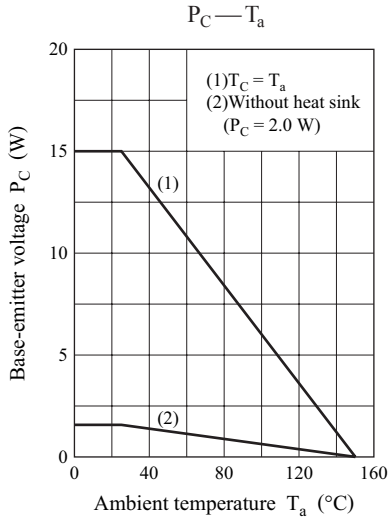
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = 30\text{ mA}, I_B = 0$	80			V
Base-emitter voltage	$V_{BE}$	$V_{CE} = 4\text{ V}, I_C = 2\text{ A}$			2.8	V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = 80\text{ V}, I_E = 0$			100	$\mu\text{A}$
Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = 40\text{ V}, I_B = 0$			100	$\mu\text{A}$
Emitter-base cutoff current (Collector open)	$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0$			100	$\mu\text{A}$
Forward current transfer ratio	$h_{FE1}$	$V_{CE} = 4\text{ V}, I_C = 1\text{ A}$	1000			—
	$h_{FE2}^*$	$V_{CE} = 4\text{ V}, I_C = 2\text{ A}$	2000		10000	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 2\text{ A}, I_B = 8\text{ mA}$			2.5	V
Transition frequency	$f_T$	$V_{CE} = 10\text{ V}, I_C = 0.5\text{ A}, f = 1\text{ MHz}$		20		MHz
Turn-on time	$t_{on}$	$I_C = 2\text{ A}, I_{B1} = 8\text{ mA}, I_{B2} = -8\text{ mA}$		0.4		$\mu\text{s}$
Turn-off time	$t_{off}$	$V_{CC} = 50\text{ V}$		4		$\mu\text{s}$

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. \*: Rank classification

Rank	Q	P
$h_{FE2}$	2000 to 5000	4000 to 10000







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